Remarks

The Office Action mailed 28 August 2001 has been received and reviewed. Claims 37, 38, and 40, having been cancelled, claims 22, 26, 30, 33, and 39 having been amended, and claims 44-52 having been added, the pending claims are claims 1, 5, 10-14, 16, 18, 19, 21-35, 39, and 41-52, of which claims 1, 5, 10-14, 16, 18, 19, 21, 23, 24, and 41-43 are allowed. Support for the new claims may be found in the Specification at page 10, line 26, page 11, line 14, and page11, line 28 to page 12, line 2. Claims 22, 25-35, and 37-40 stand rejected. Reconsideration and withdrawal of the rejections, based on the amended claims and the comments provided below, are respectfully requested

Allowed Claims

Applicants' Representative thank the Examiner for notification to the effect that claims 1, 5, 10-14, 16, 18, 19, 21, 23, 24, and 41-43 are allowed. These claims are directed to an inkjet receptor medium, and methods of making and using an inkjet receptor medium, that includes a pigment management system including functionalized particulates.

The 35 U.S.C. §112, Second Paragraph, Rejection

The Examiner rejected claims 30, 37, and 38 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Claims 37 and 38 having been cancelled renders the rejection with respect to these claims moot. For this reason Applicants respectfully request withdrawal of the rejection with respect to claims 37 and 38.

Claim 30 has been amended to depend from independent claim 22 rather than from independent claim 1. Support for this amendment may be found in the Specification at page 12, lines 28-30. In consideration of the amendment, Applicants respectfully request reconsideration and withdrawal of the rejection with respect to claim 30.

The 35 U.S.C. §102 Rejection

The Examiner rejected claim 37 under 35 U.S.C. §102(b) as being anticipated by Cousin et al. U.S. Patent No. 4,554,181).

The Examiner rejected claims 37 and 38 under 35 U.S.C. §102(b) as being anticipated by Malhotra et al. (U.S. Patent No. 5,500,668) as evidenced by Carreira et al. (U.S. Patent No. 5,220,346).

Claims 37 and 38 having been cancelled renders this rejection moot. Applicants respectfully request withdrawal of this rejection.

The 35 U.S.C. §103 Rejection

The Examiner rejected claim 38 under 35 U.S.C. §103(a) as unpatentable over Cousin et al. (U.S. Patent No. 4,554,181).

Claim 38 having been cancelled renders this rejection moot. Applicants respectfully request withdrawal of this rejection.

The Examiner rejected claims 22, 25-29, 31-35, 39, and 40 under 35 U.S.C. §103(a) as being unpatentable over Malhotra et al. (U.S. Patent No. 5,500,668) in view of Carreira et al. (U.S. Patent No. 5,220,346) and Kojima et al. (U.S. Patent No. 5,677,067). Applicants respectfully traverse this rejection. These claims are directed to an inkjet receptor medium, and methods of making and using an inkjet receptor medium, that includes a pigment management system including a multivalent metal salt.

Malhotra et al. disclose a recording sheet, including a substrate and a monomeric salt, to enable precipitation of a dye from a liquid ink onto the sheet surface during printing processes (Malhotra et al., column 10, lines 49-51). Additionally, the Examples 1-5 printed images specifying the use of inks including dyes, with the type of ink used in Example 6

unspecified. There is no teaching or suggestion that the recording sheets of Malhotra et al. are suitable for imaging using pigmented inks. Furthermore, Malhotra et al., neither teach nor suggest that a fluid management system appropriate for use with dye-based inks may not necessarily be appropriate for use with pigmented-based inks.

Applicants' invention recognizes a system for managing fluids in pigmented-based inks is needed. Applicants recognize that the chemical formulation of the pigmented inkjet ink has considerable complexity due to the requirements of continued dispersion of the pigment particles in the ink and that different media have been tried to control the management of fluids in the pigment-based inks (Specification, page 3, lines 12-14 and 19-21). It is recognized that a system that works well for managing fluids in dye-based inks does not necessarily work well for managing fluids in pigmented-based inks, and a management system for pigmented-based inks is provided.

The Declaration of Clinton P. Waller, Jr., submitted herewith, demonstrates in paragraphs 4-6 that an image printed with a dye-based ink on a substrate incorporating a composition of Applicants' invention that includes both a pigment management system and a fluid management system shows little improvement over the same image printed on the same type of substrate that did not include the composition including both a pigment management system (including a multivalent metal salt) and a fluid management system (Exhibit B compared with Exhibit A). Further, when the images of Exhibits A and B were subjected to running water, there was no visually apparent difference between the washed image of Exhibit A and the washed image of Exhibit B (paragraph 6). It could be concluded, therefore, that the composition applied to the substrate that included both a pigment management system (including a multivalent metal salt) and a fluid management system did not protect the dye-based ink image from water damage to any apparent degree.

Furthermore, the Declaration of Clinton P. Waller, Jr., demonstrates in paragraphs 7-9 that the composition of Applicants' invention used for Exhibits A and B, which includes both

a pigment management system (including a multivalent metal salt) and a fluid management system, applied to a substrate did provide significant improvement to an image printed with pigmented-based inks, as compared to an image printed with pigmented-based inks on the same type of substrate, but that did not incorporate the pigment management system (including a multivalent metal salt) and fluid management system (Exhibit D compared with Exhibit C). Additionally, the Declaration of Clinton P. Waller, Jr., shows in paragraph 9 that a composition of Applicants' invention that includes both a pigment management system (including a multivalent metal salt) and a fluid management system significantly protected pigment from being washed from the image upon subjecting it to running water (Exhibit D).

The visual quality of the images of Examples A-D, described in paragraphs 6 and 9 of the Declaration of Clinton P. Waller, Jr., demonstrates that a composition of Applicants' invention, including both a pigment management system (including a multivalent metal salt) and a fluid management system, that is useful in imaging with pigmented-based inks on a substrate, is not necessarily useful in imaging on the same type of substrate using dye-based inks. Therefore, one of skill in the art would not necessarily look to the recording sheets of Malhotra et al. that are printed with dye-based inks to provide satisfactory fluid management for printing using pigmented-based inks.

Further, one of skill in the art would not be motivated to combine the teachings of Carreira et al. with Malhotra et al. to provide a satisfactory inkjet receptor medium for pigmented-based inks. Carriera et al. do not recognize that the print quality of a dye-based ink image on a substrate may be very different than that of an image printed with a pigmented-based ink on the same type of substrate. In fact, Carriera et al. disclose that either a dye-based ink, a pigmented based ink, or mixtures thereof may be used (Carriera et al., column 6, lines 47-49). However, none of the examples of Carriera et al. produce images using pigmented-based inks. Therefore, combining the teachings of Carriera et al. with those of Malhotra et al. does not provide that which is missing from Malhotra et al.

Additionally, the compounds that include salts of metal cations as disclosed in Carriera et al. are present as an additive to the ink, and not as a component of the inkjet receptor medium. One of skill in the art would not look to Carrera et al., combined with Malhotra et al., to provide the inkjet receptor medium of Applicants' invention.

Kojima et al. also do not recognize that the quality of a dye-based ink image on a substrate may be very different than that of a pigmented-based ink on the same type of substrate. Although Kojima et al. disclose an inkjet recording sheet including an ink receiving layer with a low molecular weight gelatin that may optionally include surface active agents, the inkjet recording sheets of Kojima et al. do not include a multivalent metal salt coating along the surfaces of a porous substrate, as is claimed by Applicants. Therefore, although Kojima et al. teach surface active agents that may be of anionic type, cationic type, nonionic type, and betaine type (Kojima et al., column 4, lines 29-30), there is no teaching or suggestion that the surface active agents of Kojima et al. could be combined with the monomeric salts of Malhotra et al. to provide the inkjet receptor medium of Applicants' invention.

None of the cited documents recognize that a recording medium, such as recited in Applicants' claims, that is appropriate and advantageous for use with pigmented-based inks may not necessarily be useful in managing dye-based inks. Further, as discussed herein, the Declaration of Clinton P. Waller, Jr., demonstrates that a composition of Applicants' invention, including both a pigment management system and a fluid management system, is advantageously used for imaging with pigmented-based inks but does not provide the same advantage for images printed with dye-based inks.

It is Applicants' position that neither Malhotra et al., Carriera et al., nor Kojima et al., taken alone or in combination, would motivate one of skill in the art to provide the inkjet receptor medium of Applicants' invention. Applicants, therefore, respectfully request reconsideration and withdrawal of the rejection.

Summary

It is respectfully submitted that the pending claims 1,5, 10-14, 16, 18, 19, 21-35, 39, and 41-52 are in condition for allowance and notification to that effect is respectfully requested. The Examiner is invited to contact Applicants' Representatives, at the below-listed telephone number, if it is believed that prosecution of this application may be assisted thereby.

Respectfully submitted for
Clinton P. WALLER, Jr. et al.

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CERTIFICATE UNDER 37 CFR §1.8:
The undersigned hereby certifies that this paper is being deposited with the United States Postal Service as first class mail, in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on this 21st day of December, 2001.

By: _____
Name: Victoria A. Sandberg

APPENDIX A - SPECIFICATION/CLAIM AMENDMENTS INCLUDING NOTATIONS TO INDICATE CHANGES MADE
Serial No.: 08/892,902
Docket No.: 53473US002

Amendments to the following are indicated by underlining what has been added and bracketing what has been deleted. Additionally, all amendments have been marked in bold typeface.

In the Claims

For convenience, all pending claims are shown below.

1. (ALLOWED) An inkjet receptor medium comprising:

a porous substrate having a fluid management system and a pigment management system in contact with surfaces of pores of the substrate, wherein the pigment management system comprises functionalized particulates within the pores of the porous substrate and the fluid management system comprises a surfactant.

5. (ALLOWED) The medium of Claim 1, wherein the functionalized particulates comprise fluorinated silica agglomerates that interact with dispersant to agglomerate pigment particles as an ink containing the pigment particles passes through pores.

10. (ALLOWED) The medium according to Claim 21, wherein the microporous membrane comprises a polypropylene film co-extruded with a mineral oil followed by bi-axial stretching under thermal conditions.

11. (ALLOWED) The medium according to claim 10, wherein the microporous membrane is an opaque film.

12. (ALLOWED) The medium according to Claim 1, wherein the surfactant is selected from the group consisting of fluorocarbon, silicon, hydrocarbon-based surfactants or a mixture thereof.

13. (ALLOWED) The medium according to Claim 12, wherein the surfactant comprises a silicon-based non-ionic surfactant.

14. (ALLOWED) The medium according to Claim 12, wherein the surfactant comprises a hydrocarbon surfactant of a fatty acid.

16. (ALLOWED) A method of making an inkjet receptor medium comprising:

(a) preparing a pigment management system;

(b) imbibing the pigment management system into pores of a porous substrate, wherein the pigment management system once imbibed into the pores comprises functionalized particulates within the pores of the porous substrate; and

(c) imbibing a fluid management system into the pores of the porous substrate wherein the fluid management system comprises a surfactant.

18. (ALLOWED) A method of using an inkjet receptor medium comprising:

(a) placing an inkjet receptor medium of claim 1 in an inkjet printer; and

(b) printing an image on the medium using inkjet ink, wherein the inkjet ink comprises pigment particles.

19. (ALLOWED) The method according to Claim 18, wherein the inkjet ink further comprises a dispersant.

21. (ALLOWED) The medium according to claim 1, wherein the porous substrate comprises a microporous membrane.

22. (AMENDED) An inkjet receptor medium comprising:

a porous membrane of a synthetic polymer having a fluid management system and a pigment management system in contact with surfaces of pores of the substrate, wherein the pigment management system comprises a multivalent metal salt coating along the surfaces of the porous substrate, and wherein the fluid management system comprises a [an anionic] surfactant.

23. (ALLOWED) The medium of claim 1, wherein the functionalized particulates comprise fluorinated silica agglomerates.

24. (ALLOWED) An inkjet receptor medium comprising:

a porous substrate having a fluid management system and a pigment management system in contact with surfaces of pores of the substrate wherein the pigment management system comprises fluorinated silica agglomerates that are capable of agglomerating pigment particles in a pigment-containing ink used to print the inkjet receptor medium.

25. The medium according to Claim 22, wherein the multivalent metal salt coating comprises a multivalent salt of cations derived from the elements of Group II and above in the Periodic Table within conditions of solubility rules, wherein the salt comprises a single salt or a binary salt or a ternary salt containing counterions selected from the group consisting of nitrate, nitrite, sulfate, sulfite, bisulfite, alkanesulfonate, fluoroalkanesulfonates, perchlorate, halide, pseudo-halides, acetate, propionate, and combinations thereof.

26. (AMENDED) The medium [method] according to Claim 22, wherein the porous membrane comprises a microporous membrane.

27. The medium according to Claim 26, wherein the microporous membrane comprises a polypropylene film co-extruded with a mineral oil followed by bi-axial stretching under thermal conditions.

28. The medium according to Claim 26, wherein the microporous membrane is a phase separated membrane.

29. The medium according to Claim 22, wherein the anionic surfactant is selected from the group consisting of fluorocarbon, silicon, hydrocarbon-based surfactants or a mixture thereof.

30. (AMENDED) The medium according to Claim 22 [1], further comprising a silicon-based non-ionic surfactant.

31. The medium according to Claim 29, wherein the anionic surfactant comprises a hydrocarbon surfactant of a fatty acid.

32. The medium of claim 22 wherein the porous membrane of a synthetic polymer is a thermally induced phase separated microporous membrane.

33. (AMENDED) A method of making an inkjet receptor medium comprising:

(a) preparing a pigment management system;

(b) imbibing the pigment management system into pores of a porous membrane of a synthetic polymer, wherein the pigment management system once imbibed into pores of the porous membrane comprises a multivalent metal salt coating along the surfaces of the pores of the porous substrate; and

(c) imbibing a fluid management system into the pores of the porous membrane

wherein the fluid management system comprises a [an anionic] surfactant.

34. A method of using an inkjet receptor medium comprising:

(a) placing an inkjet receptor medium of claim 22 in an inkjet printer; and

(b) printing an image on the medium using inkjet ink, wherein the inkjet ink comprises pigment particles.

35. The method according to Claim 34, wherein the inkjet ink further comprises a dispersant.

37. (CANCELLED)

38. (CANCELLED)

39. (AMENDED) An inkjet receptor medium comprising a porous substrate comprising a multivalent metal salt coating and an anionic surfactant in contact with surfaces of pores of the porous substrate, and further comprising a pigmented ink image thereon.

40. (CANCELLED)

41. (ALLOWED) An inkjet receptor medium comprising a porous substrate comprising fluorinated silica agglomerates in contact with surfaces of pores of the porous substrate.

42. (ALLOWED) The inkjet receptor medium of Claim 41 further comprising a pigmented ink image thereon.

43. (ALLOWED) A method of using an inkjet receptor medium comprising:

(a) placing an inkjet receptor medium of claim 1 in an inkjet printer; and

(b) printing an image on the medium using inkjet ink.

44. (NEW) The inkjet receptor medium of Claim 22, wherein the surfactant is an anionic surfactant.

45. (NEW) The method of Claim 33, wherein the surfactant is an anionic surfactant.

46. (NEW) The inkjet receptor medium of Claim 1, wherein the size of the pores of the porous substrate are about 0.4μ or greater.

47. (NEW) The inkjet receptor medium of Claim 1, wherein the size of the pores of the porous substrate are about 0.75μ or greater.

48. (NEW) The inkjet receptor medium of Claim 22, wherein the size of the pores of the porous substrate are about 0.4μ or greater.

49. (NEW) The inkjet receptor medium of Claim 22, wherein the size of the pores of the porous substrate are about 0.75μ or greater.

50. (NEW) An inkjet receptor medium comprising:

a thermally induced phase separated microporous membrane of a synthetic polymer having a fluid management system and a pigment management system in contact with the surfaces of pores of the substrate, wherein the pigment management system comprises a multivalent metal salt coating along the surfaces of the microporous substrate, and wherein the

fluid management system comprises a surfactant.

51. (NEW) A method of making an inkjet receptor medium comprising:

(a) preparing a pigment management system;

(b) imbibing the pigment management system into pores of a thermally induced phase separated microporous membrane of a synthetic polymer, wherein the pigment management system once imbibed into pores of the microporous membrane comprises a multivalent metal salt coating along the surfaces of the pores of the microporous substrate; and

(c) imbibing a fluid management system into the pores of the microporous membrane wherein the fluid management system comprises a surfactant.

52. (NEW) A method of using an inkjet receptor medium comprising:

(a) placing an inkjet receptor medium of claim 22 in an inkjet printer; and

(b) printing an image on the medium using inkjet ink.